STATES PERSPECTIVE ON ALTERNATIVE LANDFILL COVERS

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Background

Established in 1995, the Interstate Technology and Regulatory Council (ITRC) is a state-led, national coalition of personnel from the regulatory and technology programs of some 44 states and the District of Columbia; three federal agencies; and tribal, public, and industry stakeholders. The organization is devoted to reducing barriers and speeding interstate deployment of better, more cost-effective, innovative environmental technologies.

Various tools have been developed and services provided by ITRC to accomplish this goal. ITRC Technical/Regulatory Guidelines, each of which deals with a specific type of technology, enable faster, more thorough reviews by state agencies of permit applications and site investigation and remediation plans for full-scale deployment of such technologies. Use of these documents by states in their regulatory reviews also fosters greater consistency in technical requirements among states and results in reduced fragmentation of markets for technologies caused by differing state requirements.

Those who conduct and oversee demonstrations and verifications of technologies covered by ITRC Technical/Regulatory Guidelines will also benefit from use of the documents. By looking ahead to the typical technical requirements for permitting/approving full-scale deployment of such technologies, they can collect and evaluate information to facilitate and accelerate the permitting or regulatory approval process for deployment.

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INTRODUCTION

The ITRC's Alternative Landfill Technologies team Compiled "Case Studies" to support the teams' Technical/Regulatory Guidance document on alternative landfill covers (ALCs). The case studies present an overview of alternative covers being used at solid waste and hazardous waste facilities. Solid waste, hazardous waste, and radionuclide waste regulation contain provisions prescribing basic covers to be used on landfills. However, each of these regulations also allows and contains provisions for the design and construction of alternative landfill covers.

The United States Environmental Protection Agency's (EPA's) has a database tracking thirty-five alternative landfill cover demonstration projects and full scale operating facilities in eighteen different states. Annual rainfall associated with these alternative landfill cover projects ranges from a low of approximately 3.5 to a high of 56 inches per year. Twenty-four of the ALCs are demonstration projects, and eleven are full-scale covers at operating facilities. There are twenty solid waste/industrial waste/construction debris demonstration projects currently in the database. There are also two hazardous waste and three mixed waste demonstration projects. (Note: Define Mixed Waste here, I searched our case studies for the term "mixed waste and found none.)

Alternative landfill covers are already in use, or the designs are approved and field testing is being conducted at pre-Subtitle D unlined facilities, Subtitle D lined faculties, Pre-Subtitle C unlined facilities, and Subtitle C lined facilities. There is Subtitle D alternative cover designs in place or approved at industrial, municipal, and debris landfills. Alternative landfill covers have several potential benefits over the current regulatorily prescribed landfill covers, while being equally protective of human health and the environment. Some of the benefits include, but are not limited to, more readily available construction materials, ease of construction, more implementable quality assurance/quality control programs, increased long term cover integrity and stability.

SCOPE AND PATH FORWARD

The current document presents several types of case studies related to solid waste and hazardous waste alternative landfill cover projects. There are three primary types of case studies. One group of cases document the alternative landfill cover regulatory controls, design, and construction process at solid waste and hazardous waste facilities. A second group, or ACAP (Alternative Cover Assessment Program), is being conducted by the Desert Research Institute, and funded by the United States Environmental Protection Agency, to document research on types of alternative landfill covers during construction,. The ACAP write-up discusses the cover elements as the test fill was constructed; the associated monitoring and an evaluation of the alternative landfill cover results. Additional ACAP research information is provided on the compact disk (CD) provided with this case study document. A third is a compilation of cited research information that was assimilated on behalf of the Air Force Center for Environmental Excellence describing alternative landfill covers, specifically evapotranspiration designs, with a discussion and references containing information verifying the concept. Equally important as the alternative landfill cover discussions provided in these case studies are the references attached to each case study, and CD attached to this document.

Each case study or suite of research information contained in this document is presented in its current status and conclusions are those of its author. This ITRC document does not attempt to establish absolute correctness of each case study, but rather presents the information so interested parties may learn from the examples. The ITRC Alternative Landfill Covers Technical/Regulatory Guidance Document (in progress) will present guidance for evaluating and making decisions on preferred approaches for regulatory flexibility, landfill design using alternative covers, construction, long term care and stakeholder relations associated with the implementation of an alternative cover given certain governing conditions.

During the compilation of these case studies and based on the experience of team members the ITRC Alternative Landfill Technologies team concluded that alternative landfill cover designs have a substantial contribution to the waste management industry and can be as protective and economically feasible as traditional capping technologies. However experience in the industry is limited and a valid guidance describing the regulatory flexibilities currently available, critical design parameters, construction considerations, monitoring and post closure care in the context of the landfill itself is necessary. The follow-up guidance from this ITRC team will encourage the proper application of this innovative technique and assure an awareness of these new cover designs within the regulatory community, consulting community and surrounding community is increased.

The federal regulations governing the design, construction and operation of solid and hazardous waste landfills includes provision for alternative landfill cover designs. Several states have adopted these regulations either without modification, or with modifications that still allow for the implementation of alternative landfill covers. In addition to the case study document the Alternative landfill Technology Team developed and issued a questionnaire to the forty four ITRC member states. The questionnaire asks a variety of regulatory and technical questions related to the permitting, design, construction, operation, and post-closure care of solid and hazardous waste alternative landfill covers. Some of the questions include:

Has your state adopted the following Federal hazardous waste regulation or a similar exemption stating 40 CFR § 264.301(b):

> "The owner or operator will be exempted from the requirements of paragraph (a) of this section if the Regional Administrator finds, based on a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (40 CFR § 264.93) into the groundwater or surface water at any future time. In deciding whether to grant an exemption, the Regional Administrator will consider 40 CFR § 264.301(b):"

Has your state modified the above referenced regulations?

Has your state approved or, in the process of reviewing, a hazardous or solid waste landfill with an alternative design cover system?

Has your state adopted the federal solid waste regulation, specifically 40 CFR § 258.60 for final design cover stating:

> "(b) The Director of an approved State may approve an alternative final cover design that includes:
> (1) An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (a)(1) and (a)(2) of this section, and
> (2) An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in paragraph (a)(3) of this section.
> (3) The Director of an approved State may establish alternative requirements for the infiltration barrier in a paragraph (b)(1) of this section, after public review and comment, for any owners or operators of MSWLF that dispose of 20 tons of municipal solid wate per day or less, based on an annual average. Any alternative requirements established under this paragraph must: (i) Consider the unique characteristics of small communities; (ii) Take into account climatic and hydrogeologic conditions; and (iii) Be protective of human health and the environment."

Has your state modified the above referenced regulations?

Has your state approved or, in the process of reviewing, a hazardous or solid waste landfill with an alternative design cover system?

Which Agency groups (hazardous waste, solid waste, superfund, mining, voluntary cleanup, etc.) have approved or are considering landfills using alternative designs? (Please enter for each: Agency, Contact Name, Telephone Number, E-mail Address)

Do any of the above groups in your State allow the use of computerized predictive models in the pre-design, design, construction, post-closure care, or monitoring of landfills?

Has your state approved the full scale construction of a landfill based solely on model results?

Does your organization prefer consideration of net infiltration volume (flux) through

Does your state consider site characteristics (e.g. depth to water, geology, etc) to establish landfill performance requirements?

What criteria do you use to establish landfill performance requirements?

What criteria does your agency use to determine the length of the Post Closure Care Period?

How does your agency modify (shorten or extend) the length of the Post Closure Care Period? How does use of an alternative landfill cover in the landfill design impact the length of the post closure care period?

Indicate which landfill types require test pads as part of an alternative landfill cover design process.

Indicate which landfill types have used data extrapolated from other alternative landfill designs to reduce or eliminate site specific testing and/or demonstrations.

Has your state approved the full scale construction of a landfill without construction and evaluation of a test pad or modeling results from information from a similar setting?

The answers to and an evaluation of the above questions will be presented as part of the presentation. This information will also be used in the development of an ITRC Technical/Regulatory Guidance Document on Alternative Landfill Covers.